units **603**, transmitting units **604**, and 2 antennas **606**. To each of the two-dimensional spreading units **603**, data (symbol) is output from a diversity processing unit **2001** prepared, for example, for each channel. A spread code generating unit **602** outputs the same spread code to each of the two-dimensional spreading units **603** for the same data.

Each of the diversity processing units **2001**, to which data is input from the multiplexing unit **601** shown in FIG. **6**, converts the data into mutually orthogonal sequences, and outputs the data after being converted to each of the two-dimensional spreading units **603**. Then, after each of the two-dimensional spreading units **603** spreads the same data (channel) with the same spread code, it outputs the data to each of the transmitting units **604**. As a result, the same signals are transmitted from the separate antennas **606**.

FIG. **21** is a block diagram explaining a configuration of a transmitting device according to a sixth preferred embodiment. The transmitting device is applied the diversity transmission technique by another method.

In the sixth preferred embodiment shown in FIG. **21**, to each of two-dimensional spreading units **603**, the same data is input from the multiplexing unit **601** shown in FIG. **6**. Accordingly, a spread code generating unit **601** outputs mutually orthogonal spread codes for the same data to each of the two-dimensional spreading units **603**. Such spread codes are output to each of the two-dimensional spreading units **603**, thereby eliminating the need for providing the diversity processing units **2001** shown in FIG. **20**.

In the configuration shown in FIG. **21**, if a pilot channel (symbol) is shared by a plurality of users, a spread code that is orthogonal to other spread codes not only as an entire two-dimensional code but also as its extracted portion, namely, spread codes that satisfy all of the above described conditions 1-3 must be generated by the number of antennas **606** or more. By example, if a spread code of SF4×4 is considered, a maximum of 4 spread codes, which are orthogonal even if they are despread with any of spreading factors SF4×1, SF4×2, SF2×2, and SFN×4 (N=1,2,4), can be allocated at the same time as shown in FIGS. **22**A-**22**C. A code domain is further enlarged or the number of spreading factors with which despreading can be made is further reduced, whereby the number of such spread codes can be further increased. A-D denoted in FIGS. **22**A-**22**C indicate the code domains of the 4 allocatable spread codes.

FIG. **23** is a block diagram explaining a configuration of a transmitting device according to a seventh preferred embodiment. This transmitting device is that implemented when an MIMO (Multiple Input and Multiple Output) technique is applied.

In the seventh preferred embodiment shown in FIG. **23**, a multiplexing unit **601** splits data (symbol) into a plurality of sequences, and outputs the sequences to each of two-dimensional spreading units **603**. Accordingly, if a pilot channel (symbol) is shared by a plurality of users in the same manner as in the sixth preferred embodiment, spread codes that are orthogonal to other spread codes not only as an entire two-dimensional spread code but also as its extracted portion, namely, spread codes that satisfy all of the above described conditions 1-3 must be generated by the number of antennas **606** or more.

Here, the other preferred embodiments implemented when the diversity transmission technique and the MIMO technique are applied are described as the fifth to the seventh preferred embodiments. However, a variety of other techniques can be applied.

What is claimed is:

1. A communication system, comprising:

a transmitter that transmits a signal by using a two-dimensional spread code used for making a spread in time and frequency directions; and

a receiver that receives the signal transmitted from the transmitter,

wherein the transmitter includes;

a selecting unit that selects spread codes in which at least one of the time and the frequency directions are mutually orthogonal, and

a transmitting unit that spreads a signal by using the selected spread codes and transmits the signal,

wherein the selected spread codes are able to be split in two or more parts each of which has a spreading factor that is made smaller than a spreading factor of respective selected spread codes in at least one of the time and the frequency directions, and each of which is mutually orthogonal with other selected spread codes in the at least one of the time and the frequency directions.

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